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ABSTRACT

This study points out the need for evaluation criteria for business resources on the Internet, so that both corporations and special libraries will be better able to judge the value of the Internet as an information source and increase their competitive edge in today's global market. The research addresses concerns that unfiltered information on the Internet is rarely subject to standards for validity and accuracy. Data was collected from two rounds of questionnaires sent to information specialists, librarians, and corporate Internet users through listservs and newsgroups. The respondents' comments suggested that business information on the Internet may well rise in perceived or actual reliability if it includes statements regarding the source of the data, if prefatory materials, "readme" files, or a statement on frequency of updates are added, and if the index shows a large degree of detail and depth. The results also stressed the need for evaluative guides rather than simple locators, for demonstration of greater usefulness of Internet information in general, and for filenames that better reflect information content. There was disagreement over whom should be called upon to index or catalog electronic information and whether Internet sources could eventually replace print sources. Sample questionnaires, with accompanying data for each question, are appended. (Contains 43 references.) (BEW)

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# A Delphi Study To Ascertain Evaluation Guidelines For Business Resources On The Internet

A Master's Research Paper submitted to the
Kent State University School of Library Science and
Information Science in partial fulfillment of the
requirements for the degree of Master of Library Science

by

Kelly R. Heidman

March, 1995

IRoss 763

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**ABSTRACT**

By developing an evaluative guide to business resources on the Internet, both corporations and special libraries will be better able to judge the value of this information source as well as increase their competitive edge in today's global market. This study combined a modified version of the Delphi technique with survey data collection. To obtain quantitative data, a questionnaire was sent along with generalized statements regarding the Internet. The resulting consensus formed from the experts illustrates the need for access to the Internet in addition to providing a set of solutions to evaluative concerns regarding this information resource. Results will provide a basis for continuing research in this area of information exchange while allowing its current users to select their sources for maximum efficiency.

## TABLE OF CONTENTS

ABSTRACT....ii

LIST OF TABLES....iv

INTRODUCTION....1
- BACKGROUND OF THE STUDY....1
- NEED FOR THE STUDY....2
- OBJECTIVES....2
- DEFINITIONS OF TERMS....3
- LIMITATIONS OF THE STUDY....6

LITERATURE REVIEW....7

PROCEDURE....16
- METHODOLOGY....16
- POPULATION....16
- DATA COLLECTION AND INSTRUMENTATION....17
- DESIGN AND ANALYSIS....19

SIGNIFICANCE....29

BIBLIOGRAPHY....32

APPENDICES....36

APPENDIX A INITIAL E-MAIL POSTING TO SOLICIT PARTICIPANTS...36

APPENDIX B PRELIMINARY QUESTIONNAIRE TO IDENTIFY EXPERTS....30

APPENDIX C DELPHI QUESTIONNAIRE ONE....32

APPENDIX D DELPHI QUESTIONNAIRE ONE - DATA....35

APPENDIX E DELPHI ROUND ONE - SUMMARY....63

APPENDIX F DELPHI QUESTIONNAIRE TWO....68

APPENDIX G DELPHI QUESTIONNAIRE TWO - DATA....73

LIST OF TABLES


| Table | Page |
|---|---|
| 1. Composition of Experts | 20 |
| 2. Round One - Information Agreement | 23 |
| 3. Round One - Internet Agreement | 24 |
| 4. Round One - Disagreement | 25 |
| 5. Round Two - Agreement | 27 |
| 6. Round two - Disagreement | 28 |

# INTRODUCTION

## 1.1 BACKGROUND OF THE STUDY

The Internet is not one specific entity, but rather a term given to a computer network which is comprised of thousands of computers linked together worldwide. Other networks, such as Bitnet and Usenet, although separate entities, are considered a part of the term "Internet" for this study. All these sources offer almost unlimited opportunities in electronic communication, information transfer and research. Many special libraries and businesses are using the network to further their information needs and competitive advantage. The overwhelming barrage of information available through the Internet, however, is at once both positive and negative. To date, there is no evidence of scientific evaluation available for information on the network, which is traditionally important to these user groups. Although generalized treatment of this area has been addressed through popular and scholarly literature, scientific research has only just begun. It is vital to establish a set of benchmarks against which resources available through this network can be measured and evaluated for quality. Expert consensus was sought to develop these benchmarks and provide a basis for conclusions regarding the value of the Internet as an essential element in today's expanding world economy.

## 1.2 NEED FOR THE STUDY

Popularity and exponential growth of the Internet have increased dramatically over the past few years, now including commercial users as well as universities and research organizations. Special libraries, while seeing the need to utilize the networks for resource sharing and additional patron services, must redefine their roles in a global networking environment. To this end, establishment of resource assessment guidelines will enable information specialists to provide quality services in the business world by navigating through an uncertain environment and selecting appropriate tools. The ability to locate accurate information is essential to businesses and libraries that provide information services to these users. By utilizing the results of this study, the Internet will be useful as an information source as well as help to increase productivity of information professionals.

## 1.3 OBJECTIVES

The following questions served to guide this research project. The intent of this study was to clarify these questions as well as examine the current status of the Internet and its place in special libraries and businesses.

1. Though directories exist, are there any evaluative guides to apply to business resources on the Internet?

2. Are there any filters available to distinguish valid, quality data from incomplete, unverified information?

3. Are there any groups, experts or areas on the network which require certain standards of quality for their data before it is posted, and is this data verified?

4. What standards are important to the business and

special library communities with regard to their information needs?

5. If information from the network is utilized by these user groups, does it aid them with respect to efficiency? Would an assurance of accurate information on the network increase both its efficiency and the usefulness of this resource?

6. If business information is found on the network, is it assumed to be accurate or used without guarantees of validity?

7. Are special libraries and businesses interested in a resource where information gained through the network is subjectively reviewed by experts and judged to be quality information before they receive it? Would they pay for this in addition to the regular online fee for connection to the network?

## 1.4 DEFINITIONS OF TERMS

For this study, the **Internet**, also referred to as the **network** in the study, is defined as the worldwide network of computers running the Transmission Control Protocol/Internet Protocol, or TCP/IP. This will include any smaller local networks which have the capability to transmit electronic data and connect to the Internet. Other network terms are defined as follows:

**FTP--File Transfer Protocol**; a protocol that defines how to transfer files from one computer to another.[1]

**Telnet**--A "terminal emulation" protocol that allows you to log in to other computer systems on the Internet.[2]

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[1]Ed Krol, The Whole Internet: User's Guide and Catalog, ed. Mike Loukides, (California: O'Reilly & Associates, 1992), 357.

[2]Ibid., 362.

**Special libraries** are defined as any member of the United States Special Libraries Association, headquartered in Washington, DC (see note in Appendix A for libraries classed by subject), or any library associated with a business or institution which provides specialized collections or services. **Businesses** refers to any organization either profit or non-profit engaged in activities of exchanging commodities, meaning either goods or services.

**Information needs** are defined as any data which meet a set of criteria established as essential or helpful by the user groups included in this study. No attempt was made to include the concept of "information" as an element to be examined. Research into this area was considered beyond the scope of this study and it is suggested that the reader consult other papers for more complete coverage of this theory.

**Evaluative guides**, or **resource guidelines**, refers to a checklist of items, either questions or statements, which can be consulted to judge the integrity and worth of any resource available through the Internet. This does not encompass basic directory information currently available in print or through the network. Evaluation will consider the following items:

(a) credibility of source or information presented

(b) intended audience consideration

(c) reference value versus timeliness

(d) presentation of material

(e) uniqueness of material[3]

(f) clarity and knowledge of search topic

(g) depth of information needed

(h) familiarity with relevant items[4]

**Quality**, or **value**, will encompass the same characteristics that Auster and Choo felt important from previous studies regarding "perceived source quality... which include relevance, reliability, accuracy, quantity, and timeliness."[5]

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[3]Morris E. Chafetz, "Toward Increasing Quality Consciousness for Alcoholism Literature," Journal of the American Society for Information Science 27, no. 3 (May-June 1976): 162-170.

[4]David R. Morehead and William B. Rouse, "Online Assessment of the Value of Information for Searchers of a Bibliographic Data Base," Information Processing and Management 21, no. 2 (1985): 83-101.

[5]Ethel Auster and Chun Wei Choo, "Environmental Scanning by CEOs in Two Canadian Industries," Journal of the American Society for Information Science 44, no. 4 (May 1993): 194-203, citing R. Zmud, "An Empirical Investigation of the Dimensionality of the Concept of Information," Decision Sciences 9 (1978): 187-195; R.S. Taylor, Value-added Processes in Information Systems, (Norwood, N.J.: Ablex, 1986); M.S. Nilan, R.P.Peek and H.W. Synder, "A Methodology for Tapping User Evaluation Behaviors: An Exploration of User's Strategy, Source and Information Evaluating," in Proceedings of the 51st ASIS Annual Meeting, Atlanta, GA, October 23-27, 1988, by the American Society for Information Science: American Society for Information Science, 1988, 152-159; D. Halpern and M.S. Nilan, "A Step Toward Shifting the Research Emphasis in Information Science from the System to the User: An Empirical Investigation of Source-evaluation Behavior, Information Seeking and Use," in Proceedings of the 51st ASIS Annual Meeting, Atlanta, GA, October 23-27, 1988 by the American Society for Information Science; American Society for Information Science, 1988, 169-175.

**Filters** will be defined by one of the following elements:

(a) professional or expert opinion; or

(b) Internet groups, such as academically monitored discussion groups, electronic journals or newsgroups.

**Efficiency** will be used as Webster's New Collegiate Dictionary defines it, "effective operation as measured by comparison of production with cost (as in energy, time, and money)."[6]

## 1.5 LIMITATIONS OF THE STUDY

The Internet and issues relating to it are only now beginning to be researched. A decided limitation to this study was the reliance on secondary sources such as journal articles, presented papers and popular literature, due to an absence of scientific study in this area. Research in other subject areas was considered to provide a basis for general evaluation guidelines.

Criticism of methodology, that being a modified Delphi, is accepted as another limitation. This study used, as Linstone and Turoff explain, "experiences as the prevailing mode of interaction...occurring when (a) panelists are familiar with each other and identify with the subject or

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[6]Webster's New Collegiate Dictionary, 1975 ed., s.v. "Efficiency."

sponsor of the Delphi inquiry and (b) the generic form of expected product of the inquiry is clearly indicted."[7] Because initial contact of potential experts was obtained through e-mail, many members shared common interests and possibly a knowledge of others who may have been included in the expert group. However, due to the nature of the Internet and its communication flexibility, the results of this study can be generalized to a wider user population than studied. Concerns over choice of experts is accepted as bias to an extent, and the researcher encourages further investigations to increase the validity of the findings.

## 2. LITERATURE REVIEW

Extensive review of relevant databases was conducted, including the following: ERIC, Information Science Abstracts, Library Literature, Lisa, Infotrac, Sociofile, Psychlit, Dissertation Abstracts and Dialog. Online Public Access Catalogs used included Kent State's Catalyst and Ohiolink. Electronic resources, such as e-mail, newsgroups and online sources were consulted.

Some of the literature reviewed is not actual research, which is a result of the recent commercial development of the Internet and as of this date, no available research. Expansion into related literature, such as techniques of information

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[7]Harold A. Linstone and Murray Turoff, ed. The Delphi Method (Reading, Mass.: Addison-Wesley Publishing Co., 1975), 59.

retrieval, value and relevance of information, users' needs and information seeking behaviors was utilized.

Earliest literature helped to develop a basis for evaluating network information. Chafetz in "Toward Increased Quality Consciousness for Alcoholism Literature" provided some considerations for evaluation. His comments referred to print sources, yet credibility and intended audience, among other criteria, are considerations which need to be addressed in a network environment. Censorship through evaluation was another concern which Chafetz[8] and the researcher consider inappropriate and avoidable. In 1978, Zmud offered insight into the evaluation elements for management information systems. He established essential elements needed for information evaluation within the context of a users' perception. These suggested dimensions of information have continued to be the standards upon which further research have been based. His conclusion that "...the findings reinforce the sentiment that the manner in which data is presented to a decision maker is critical to his perception and subsequent usage of the data..."[9] was considered relevant for this study. The research completed by Morehead and Rouse contributed further elements for consideration, based partially on the findings of Zmud. Of these, perhaps the four concerns of

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[8]Chafetz, 164,170.

[9]Robert W. Zmud, "An Empirical Investigation of the Dimensionality of the Concept of Information," Decision Sciences 9, no. 2 (1978): 187-195.

clarity, knowledge, depth and familiarity are the most relevant to network information seeking.[10] A study on services, information and evaluation by Deutsch and Malmborg investigated the issues of stakeholders and evaluation. Although weak in its limitations and conclusions, this report did reinforce the concept that a user's perception, or in this case, the stakeholder's objectives, could affect how information or services were judged.[11]

In 1991, in "Beyond OPACS...The Wealth of Information Resources on the Internet," Kalin and Tennant pointed out, even at this early stage of the Internet, the problems with evaluating electronic information. The "...inability to browse quickly the contents..."[12] is still an issue today and it is evident that judging the contents of information resources on the network will require different techniques than those used for print or CD-ROM. Caroline Arms continued this thought in "Internetworking Services and the Electronic Library," by commenting on the lack of centralized control of services and

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[10]Morehead and Rouse, 88.

[11]Stuart Jay Deutsch and Charles J. Malmborg, "A Study of the Consistency of Stakeholder Preferences for Different Types of Information in Evaluating Police Services," Evaluation and Program Planning 9, no. 1 (1986): 13-24.

[12]Sally W. Kalin and Roy Tennant, "Beyond OPACS...The Wealth of Information Resources on the Internet," Database 14, no.4 (August 1991): 28-33.

the problems identifying valuable resources.[13] The collection of independent groups contributing to the network is at once both a strength and a weakness, depending on the viewpoint one chooses.

Nineteen-ninety-two brought about more detailed discussions regarding the growth and possibilities associated with the network. Special librarians were already using the Internet to network with each other and for resource sharing, according to a survey by Ladner and Tillman. Over ninety percent of these users responded that e-mail was the primary use and major advantage of the Internet.[14] The use of the network for improved communication through e-mail was also found to be a benefit to Dynix corporation, in "Using Internet: Benefits to a Corporation." They included increased productivity and fostering professional development as additional positive factors.[15] Research and discussion dealing with information and its value continued to be explored. Of the discussions, Duncan continued previous research observations in "The Essentialities of Productivity

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[13]David H. Brunell,"Internetworking Services and the Electronic Library," Journal of Library Administration 15, no. 3/4 (1991): 21-36, citing Caroline R. Arms, "A New Information Infrastructure," Online 14, no. 5 (September 1990): p.19.

[14]Sharyn J. Ladner and Hope N. Tillman, "How Special Librarians Really Use the Internet," Canadian Library Journal 49, no. 3 (June 1992): 211-215.

[15]Gail Wanner, "Using Internet: Benefits to a Corporation," in 13th National Online Meeting: Proceedings 1992, by the National Online Meeting (Medford, NJ: Learned Information, 1992), 417-426.

in Information Services," by stating that it is the users who define the value of information. His ideas that information is subjective in nature, time dependent and situation dependent[16] are concepts which were considered when developing the questionnaire used in this study. Clark and Augustine also researched the measurement of information value. Their findings contributed important evidence that inferior information quality, and specifically a decrease in accuracy, affected a firm's profitability, cost performance and efficiency.[17]

Allan Earle in "Hacker Heaven" discussed the exponential growth of the Internet in 1993, listing estimates of over twenty million users in ninety-one countries. The number of corporate networks linked to the network was estimated at over fifteen thousand, and the current rate of expansion placed estimates that the network was "doubling in size every ten months...creating one of the pivotal business developments of the nineties."[18] Perhaps his most relevant point was noting that with ease of access to the networks, the size of a business was no longer a concern. Smaller enterprises were

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[16]Joseph W. Duncan, "The Essentialities of Productivity in Information Services," Information Society 8, no. 2 (April-June 1992): 77-82.

[17]Thomas D. Clark and Fred K. Augustine, Jr.,"Using System Dynamics to Measure the Value of Information in a Business Firm," System Dynamics Review 8, no. 2 (Summer 1992): 149-173.

[18]Allan Earle, "Hacker Heaven," Canadian Business 66, no. 12 (Dec. 1993): 63-65.

able to compete in a global market as well as the large corporations. The president of the Internet Society felt that the network could reach estimates of one billion network systems, while a member of the International Engineering Task Force noted the problems with data integrity still remained, indicating continued growth with little attention to quality.[19] Many of the journal articles commented on the continued importance of the networks for e-mail and its usefulness in the collaborative efforts of businesses and scientific studies. Relevant papers published during this year included more cognitive research on information value and behaviors. One study, by Auster and Choo, while refuting earlier research in user studies, did correlate with the findings of the previously discussed 1992 study from Clark and Augustine. The conclusions from Auster and Choo's investigation into environmental scanning patterns of business CEOs found that of "environmental uncertainty, source accessibility, and source quality, source quality is the most important factor on explaining source use in scanning."[20] Results from Rocheleau's "Evaluating Public Sector Information Systems: Satisfaction versus Impact" discussed many concepts relating to information systems which apply to the network environment. When evaluating user satisfaction with

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[19]Cheryl Gerber, "Booming Commercial Use Changes Face of Internet," Infoworld 15, no. 15 (April 1993): 1, 38.

[20]Auster and Choo, 194.

information retrieval and search strategies, he found that many times users' expectations of information systems are too high, thus creating dissatisfaction when reality does not match their goals. Related to this was the conclusion that user perceptions of a system were often more important than reality. He stated that "if users don't think that an information system is having any impact, they may be less likely to use or support the system."[21] Additionally, many times decision makers may benefit from information obtained through an information system, yet they may not actually utilize the system themselves. His observations that satisfaction is dynamic, changing as the user learns, support earlier studies in this area. This indicates the need for a distinction between user satisfaction and impact of the information obtained on the organization's goals and performance to preserve a valid evaluation of both entities. Satisfaction has often been judged through relevance, and the amount of research in this area is immense. The intent of this study was not to continue relevance research, but to incorporate it as one element to be considered when evaluating network resources.

An investigation into relevance by Louise T. Su found that it should not be the only criterion for system evaluation. She included effectiveness, efficiency,

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[21]Bruce Rocheleau, "Evaluating Public Sector Information Systems: Satisfaction Versus Impact," Evaluation and Program Planning 16, no. 2 (April-June 1993): 119-129.

interaction, searcher, service, system and user as factors which should be considered when attempting to evaluate an information retrieval system.[22] These factors were incorporated into this study by combining them with other elements in the initial Delphi questionnaire. Document presentation and representation on the networks were additional areas which were included in the evaluation criterian for this study. The Online Computing Library Center (OCLC), located in Ohio, completed research involving the access, use, and cataloging of information found on the Internet. Of all the research available, this study was perhaps the most vital. Their findings indicated several important areas which needed to be incorporated into a consideration of presentation and evaluation of materials. They concluded that most traditional methods of identification and cataloging of materials were not adequate for Internet information. Most files contained incomplete bibliographic details, information was difficult to locate, and the "value of the information files such as 'readme' or 'index' could vary greatly depending on the completeness, clarity, and

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[22]Louise T. Su, "Is Relevance an Adequate Criterion for Retrieval System Evaluation: An Empirical Inquiry into the User's Evaluation," in ASIS '93: Proceedings of the 56th ASIS Annual Meeting, Columbus, Oh, October 24-28, 1993, by the American Society for Information Science (Medford, New Jersey: Learned Information, Inc., 1993), 93-103.

currency of the descriptive information provided."[23] There were indications these files could be more useful, yet they occurred infrequently. Another problem was the low correlation between file contents and file names. The amount of files stored at any site capable of providing FTP services was also found to create a difference in usefulness. The larger FTP sites tended to have more directory hierarchies, thus organizing their information better than sites with a smaller number of files. Carol Barry, in her research on document representations and predicting relevance, found that abstracts and titles were used to indicate relevance and provide the most information regarding an item.[24] Her conclusions, combined with the OCLC findings, indicate some of the obstacles librarians and businesses face in identifying, obtaining and evaluating quality items through the Internet.

It is evident that users of information have been studied for their preferences and needs. Quality of information has been demonstrated to be a primary factor in the usefulness of information to businesses and libraries. Through a consensus of experts, evaluative guidelines can be

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[23]Martin Dillon, Assessing Information on the Internet (Dublin, Oh: OCLC Online Computer Library Center, Inc., Office of Research, 1993), 1-39, OCLC, OCLC-OR-RR-93-1.

[24]Carol L. Barry, "A Preliminary Examination of Clues to Relevance Criteria within Document Representations," in ASIS '93: Proceedings of the 56th ASIS Annual Meeting, Columbus, Oh, October 24-28, 1993, by the American Society for Information Science (Medford, New Jersey: Learned Information, Inc., 1993), 81-86.

established which will enable these users to identify and use the best of what the Internet has to offer.

## 3. PROCEDURE

### 3.1 METHODOLOGY

A modified version of the Delphi technique was used for this study. The tool used was a series of questionnaires designed to extract expert opinions regarding development of evaluation standards for Internet resources.[25] Initial contact of potential experts was accomplished by posting a notice to discussion and Usenet groups. Initially, it was planned to send questionnaires to members of the Special Libraries Association in northeast Ohio, as well as randomly selected corporations. After receiving well over fifty inquiries through e-mail, the final Delphi group consisted primarily of information specialists, librarians, and corporate users from across the United States.

### 3.2 POPULATION

The literature review indicated that special libraries and corporations were among the first groups of potential

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[25]Kai Arthur Sorensen, "A Delphi Analysis of the Gero-Communications Needs of the Aged in Marquette County, Michigan" (Ph.D. diss., Kent State University, 1982), 192; and Donald Ralph Cooper, "A Delphi Analysis of Priority Societal Problems and Resources of the Communication Field" (Ph.D. diss., Kent State University, 1977), 102-161.

users to extensively utilize the variety of information resources on the Internet. Early and continued use of the network by these groups gave them the advantage of experience and the rationale for choice of subjects for this study. After receipt of the e-mail message indicating an interest to participate, a preliminary form was sent to respondents which sought to narrow the group by expertise. Questions pertaining to professional background and knowledge of the Internet were asked and the final group consisted of twenty-five information specialists, librarians and corporate users.

### 3.3 DATA COLLECTION AND INSTRUMENTATION

To date, there were no research reports published in this area of interest. Therefore, the initial and subsequent questionnaires utilized were based on a combination of factors found to be important when evaluating other types of information resources. It was the objective of this study to increase the usefulness of the Internet for any potential user as well as provide a basis for further research in this area.

The initial identification of participants was obtained by contact through e-mail and all subsequent questionnaires were sent through traditional mail service. It was felt that time spent answering questionnaires on-line might pose work-related problems. Also, many network administrators strongly discourage the use of their space for questionnaires or

studies. The initial call for participants was posted to the following discussion and Usenet groups:

1. Slaite-L - the Special Libraries discussion group originating at Babson College (address Slaite-L@BABSON.EDU)

2. Buslib-L - the business discussion group (address Buslib-L@IBDSU.EDU)

3. Libref-L - library reference and discussion group (address Libref-L@KENTVM.KENT.EDU)

4. Usenet group Biz.Comp.Services - business and computer related topics.

5. Usenet group Biz.General - business topics in general.

6. Usenet group Biz.Misc. - any topic related to business.

The items included sought to identify areas of use on the Internet, information needs and current evaluation techniques. It was the intention of this study to gatner quantitative data obtained through the Delphi rounds and "bring into focus the priorities and preferences of experts in positions to influence the development of the subject under consideration."[26] Following analysis of the preliminary return, experts were selected based on their knowledge and understanding of the Internet, as well as their use and amount

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[26]Adele E. Friedrich, "Competencies for the Information Professional in the Coming Decade: A Delphi Study" (Ph.D. diss., University of Pittsburg, 1985), 52, citing Elizabeth Dyer, "The Delphi Technique in Library Research," Library Research 1 (1979): 41-52.

of experience. A letter of invitation and outline of the study was then sent to qualified participants. Problems or questions regarding the questionnaires or study were answered through e-mail, but all rounds were sent through regular mail. The first round questionnaire was pre-tested on available students and faculty in the library and information science fields at Kent State University. Due to the small, homogeneous nature of the expert population, this study was reduced to two Delphi rounds.

**3.4 DESIGN**

Weeks 1 and 2-- Finalized literature review.

Weeks 3 and 4 -- Developed and distributed introductory letter and preliminary questionnaire, pre-tested round one.

Weeks 5,6,7 -- Posted notice through Internet for participants, sent out preliminary forms and selected experts.

Weeks 8,9 -- Distributed round one.

Weeks 10- 32 -- Analyzed results from first questionnaire and developed second questionnaire.

Weeks 33 and 34 -- Distribute second questionnaire and analyzed results.

Weeks 35,36,37 -- Analyzed final round.

Week 38 -- Report findings.

All questionnaires were developed and revised by the researcher, in conjunction with respondents' input. The time schedule presented was not planned, but the result of a

variety of unforeseen factors. It is recognized that the delay between rounds one and two might be a limitation of this study, although a complete summary of round one was included with the final round. Data analysis was accomplished by utilization of the SPSS statistical program. The values assigned to each response along with the frequencies were analyzed.

**Preliminary Round.** This questionnaire was constructed in order to better select on a scientific basis which of the interested professionals could best be considered "expert." (See Appendix B) This selection process is where the Delphi study again receives criticism. However, by selecting participants on the basis of their experience and knowledge, the impact of this criticism is lessened. The categories developed for this process were: Experience; Services Performed; E-Conferences, Journals Used or Moderated; and, Type of Use. Additionally, a section for User Identification and Position was included in order to identify the characteristics of the population. Except for the Type of Use, all questions were closed format. The composition of the experts by position is shown in Table 1.

Table 1

| Professional Position | # of Final Experts |
|---|---|
| Special Librarians | 1 |

| | |
|---|---|
| University/Academic Related | 5 |
| Librarian | 6 |
| Information Specialist | 2 |
| Combination | 11 |

Note - Combination was typically one of the categories mentioned above in addition to one or more of the other categories listed as choices.

Of almost sixty individuals who responded to the initial e-mail posting (See Appendix A) and were sent preliminary packets, thirty-eight returned their preliminary packets. Of those thirty-eight, thirty experts were identified for the study. First round packets were then distributed.

**Delphi Round One**. A letter of invitation and outline of the study accompanied round one and was sent to thirty experts. (See Appendix C) A stamped, self-addressed envelope was included with each packet, and instructions to complete the forms. Respondents were asked to return the completed forms within one week. A total of twenty-five questionnaires was returned. The questionnaire was designed in three separate sections; Information--User Evaluation and Selection; Current Internet Evaluation; and Internet Resources--Use and Organization. Each section contained a series of statements which were to be evaluated from the perspective of business usage, on a five-point Likert scale. Respondents were asked to rate their feelings from "Strongly Agree," "1" to "Strongly Disagree," "5." All questions were worded in a positive manner, so a response for agree or disagree would be uniformly

rated. The total number of items in round one was thirty-six. A blank section was included at the conclusion of the questionnaire for additions or comments.

**Delphi Round Two.** This round was designed to finalize consensus regarding evaluative strategies for business resources by taking into consideration results from round one. The twenty-five experts from round one were sent a cover letter with instructions for round two, summaries of round one, the second and final questionnaire, and a self-addressed stamped envelope. The time span allotted for return of this round was again one week. The questionnaire was designed with a five-point Likert scale response identical to round one. This round listed thirty suggestions or solutions to aid in the development of evaluative guidelines. Experts were again given an opportunity to add their comments or suggestions at the conclusion of the questionnaire. Due to the high rate of agreement within round one, the decision was made to drop the third round of this study. Rather than ranking a list and then rating the desirability, the second round offered both possible solutions and choice as to desirability in one step.

## 3.5 DATA ANALYSIS - ROUND ONE

The first round questionnaire was analyzed for frequency and weights. All results for round one can be found in Appendix D.) The weights were equivalent to the number given

on the scale, that being "Strongly Agree, 1" equal to "1" and "Strongly Disagree, 5" equal to "5." In cases where a question was not answered by all respondents, the average for that question was adjusted to match the number of actual responses. The mean score was determined for each item and only those items with an average of 2.0 or higher, or 3.0 and lower were retained for inclusion in the second round. It was felt that this would place a focus for the research in those areas in which experts had a strong commitment in either a positive or negative opinion. A few items from round one rated on the extreme. The following items in Table 2 received a high rate of agreement in current information use and evaluation (numbers correspond to item location in questionnaire):

Table 2

| Issue | Mean Score |
|---|---|
| A1. Credibility of the provider | 1.28 |
| A2. Depth or scope | 1.72 |
| A3. Accuracy | 1.24 |
| A4. Consistency/Convenience | 1.80 |
| A5. Clarity/Readability | 1.76 |
| A6. Currency | 1.76 |
| A7. Ability of searcher to understand | 1.91 |
| A8. Ability of users to understand | 1.88 |
| A13. Ease of access | 1.72 |

Of the Internet specific statements, Table 3 illustrates those which rated strong in agreement:

Table 3

| Issue | Mean Score |
|---|---|
| B2. Evaluation of material is important | 2.00 |
| B4. Evaluation service would increase usefulness of the network | 1.56 |
| B6. Use of the network to meet information needs | 2.00 |
| B9. Use of the Internet increases work efficiency | 2.00 |
| C1. Use discussion groups, or Usenet to help decipher worthwhile resources | 1.96 |
| C2. Archie/Veronica useful for finding resources | 1.80 |
| C3. Gopher/Mosiac useful for finding resources | 1.36 |
| C6. Use of "readme" file to help evaluate | 1.80 |

The high degree of consensus and the utilization of standard evaluative techniques for business information indicated that this area of information usage did not require unique guidelines for evaluation. Reliance upon standard guidelines indicated that perhaps the second round should offer solutions to Internet evaluation by a combination of new and existing guidelines. These results were considered when constructing the second round statements. The scores for Internet specific items indicated that currently, peer evaluation was used extensively for evaluation and structured methods such as a file name do not represent the contents accurately, nor are they used in that manner.

Of the first round statements which resulted in an overall consensus of disagreement, the following statements were of particular interest:

Table 4

| Issue | Mean Score |
|---|---|
| B8. Utilization of the Internet for primarily e-mail | 3.60 |
| C4. File names accurately represent data contained within the files | 3.88 |
| C5. Judge relevance of information contained within the file by file names | 4.08 |
| C7. Indexes accurately reflect database contents | 3.48 |

Again, the methods which many researchers might use to quickly evaluate, those being file names or indexes, experts agreed were not accurate or useful for evaluation. Of interest is the expansion of Internet usage beyond primarily e-mail, indicating that this user population is putting more emphasis on the Internet as a primary information resource. With these results in mind, the second round aimed to provide solutions to these problems, or to offer suggestions which incorporated traditional evaluation guidelines within an electronic environment.

## 3.6 DATA ANALYSIS - ROUND TWO

Of the twenty-five questionnaires sent out, eighteen were returned. One of the eighteen was returned unanswered, dropping the respondents to seventeen. A few possibilities exist as to reasoning behind the non-respondents. Primarily,

it may have been the length of time between rounds one and two, due to unforeseen problems. Secondly, positions and people change over time and it may be that some of the seven non-respondents had moved since the first round. Seventeen, however, was sixty-eight percent of the first round respondents, and was decided to be sufficient.

Data analysis was performed using the SPSS statistical package. The available choices for responses were identical to those used in the prior round. Scores were averaged and the mean was based on the number of viable respondents. There were only three cases in which the questions were not completed by all respondents, and for those questions, the average was based on the number of complete responses. There are many discussions, articles, and overviews of the Internet and research. To date, the researcher could not locate any actual research dealing with these particular issues, aside from those mentioned previously. It is therefore recognized that the choices and composition of the surveys could be improved, and it is hoped that future research will note the possible flaws and strive to improve upon the results.

Data from the second round met with greater consensus on both agreements and disagreements (see Appendix G). Those items which gained highest agreement are shown in Table 5.

Table 5

| Issue | Mean Score |
|---|---|
| 1. Include statements regarding the source of data | 1.17 |
| 2. Prefatory materials should be added | 1.41 |
| 8. Frequency of updates should be included | 1.58 |
| 13. Directory organization varies from site to site | 1.88 |
| 20. Need to demonstrate usefulness of network beyond e-mail | 1.52 |
| 23. Knowledge in Veronica queries would increase effectiveness of network use | 1.81 |
| 25. Better estimation of file contents by thesaurus construction | 1.70 |
| 26. Associate subject headings with files | 1.82 |
| 27. Recommended sites have "readme" files | 1.68 |
| 28. Greater detail in indexes | 1.86 |
| 30. Use of gopher/bookmarks recommended | 1.52 |

From these results, certain observations are evident. Currently, organization and evaluation of Internet sites need to be improved. Experts agree that usage has increased beyond the scope of e-mail, and they are looking for ways to organize and utilize this resource. The expansion of the World Wide Web and windows-based front-ends has created easier access, but has not addressed quality. Consideration of these results would indicate that to become a useful business source, providers need to address those issues which researchers are missing. Greater details for indexes, readme files, update notifications, and source of the data are items which need to be improved or added.

Items which met with greatest disagreement are shown in the following table:

Table 6

| Issue | Mean Score |
|---|---|
| 11. Anyone can successfully navigate through a search | 3.82 |
| 15. Panel of catalogers should organize business sources | 3.29 |
| 18. Internet sources can replace print sources | 3.05 |

Of particular interest is the result from the question regarding catalogers. Respondents were in agreement that subject headings and greater detail in indexes would aid in the ability to locate appropriate documents. Yet, they disagree that catalogers should begin to organize sources. Perhaps the term "catalogers" partially affected the responses, although it would seem these individuals are most familiar with subject headings. For future studies, it might be advisable to offer choices of occupations such as indexers or abstractors rather than one particular area. The other results align with the sections that met with agreement. It seems evident that network organization does not yet allow for successful search results without aid from an information specialist, nor can this resource replace traditional print sources.

## 4. SIGNIFICANCE

The opinions gathered from the experts in this study provided the first substantive research regarding network information resources and judgments of their quality and usefulness to special libraries and corporations. As the Internet grows in size and popularity, libraries and businesses can utilize the results of this research to increase their competencies in the electronic information age leading to expanded efficiency and viability. The results indicated the following statements should be considered when evaluating business resources on the Internet, or should be added to considerations when utilizing this resource:

1. Look for materials which can provide aid to evaluation, such as prefatory materials and source of data. Reinforce the use of the Internet with secondary sources.

2. The Internet is useful for more than just e-mail, but the wider user population within the business environment needs to understand the potential of this resource. At the same time, current organization of the Internet does not lend itself to successful search results without the aid of an information specialist.

3. Currently, file names and directory names do not provide an accurate indication of the information contents. Further development into options such as thesaurus construction for file and database names, assigned subject headings, and standardized presentations were seen as options,

but the feasibility may be questionable. Although no answer to this problem may be available, it is critical to evaluation of resources to understand the problems in these areas.

Many of the questions which this study sought to clarify did not gain a significant response in either direction to enable a conclusion. There was a neutral position in regards to knowledge of evaluative guides currently available for the Internet. From many of the comments, there was an inability to distinguish locator guides from evaluative guides. From the researchers' view, a listing of available sources does not indicate an evaluative comment on those resources. Perhaps the wording of the statements could be revised in future studies to avoid this confusion.

Neutrality was also the result from statements on groups which require certain standards before posting data. This area is in a constant state of flux, and perhaps the motion of the Internet will never be stilled enough to allow a statement such as this to find agreement. The movement of information and groups on the networks is such that many times, a location may be in existence for only a few months. However, knowledge of the nature of the networks can in itself be a method to evaluation. If the resource is heavily utilized and intact for a longer period of time, it may be open to more detailed analysis.

The standards of importance to the business and special library communities seem evident from the results. The

respondents represented a variety of backgrounds, and came to agreement on many of the issues facing information professionals today. It is hoped that these results will aid not only this group, but all those who seek to enhance their knowledge by sharing in the global community which has developed on the Internet.

## BIBLIOGRAPHY


Arms, Caroline. "A New Information Superstructure." Online 14, no. 5 (September 1990): 19. Quoted in David H. Brunell, "Internetworking Services and the Electronic Library." Journal of Library Administration 15, no. 3/4 (1991): 21-36.

Auster, Ethel, and Chun Wei Choo. "Environmental Scanning by CEOs in Two Canadian Industries." Journal of the American Society for Information Science 44, no. 4 (May 1993): 194-203.

Barry, Carol. "A Preliminary Examination of Clues to Relevance Criteria within Document Representations." In ASIS '93: Proceedings of the 56th ASIS Annual Meeting, Columbus, Ohio, October 24-28, 1993, by the American Society for Information Science. Medford, New Jersey: Learned Information, Inc., 1993, 93-103.

Broadbent, Marianne, and Hans Lofgren. "Information Delivery: Identifying Priorities, Performance, and Value." Information Processing and Management 29, no. 6 (November/December 1993): 683-701.

Brunell, David. "Internetworking Services and the Electronic Library." Journal of Library Administration 15, no. 3/4 (1991): 21-36.

Butler, John T. "A Current Awareness Service Using Microcomputer Databases and Electronic Mail." College and Research Libraries 54, no. 2 (March 1993): 115-123.

Chafetz, Morris E. "Toward Increased Quality Consciousness for Alcoholism Literature." Journal of the American Society for Information Science 27, no. 3 (May/June 1976): 162-170.

Clark, Thomas D.,Jr., and Fred K Augustine, Jr. "Using System Dynamics to Measure the Value of Information in a Business Firm." System Dynamics Review 8, no. 2 (Summer 1992): 149-173.

Cooper, Donald Ralph. "A Delphi Analysis of Priority Societal Problems and Resources of the Communication Field." Ph.D. diss., Kent State University, 1977.

Cronin, Mary J. Doing Business on the Internet: How the Electronic Highway is Transforming American Companies. New York: Van Nostrand Reinhold, 1994.

Dalkey, Norman C., and Daniel L. Rourke. Experimental Assessment of Delphi Procedures with Group Value Judgments (Santa Monica, California: Rand Corp., 1971), R-612.

Deutsch, Stuart Jay, and Charles J. Malmborg. "A Study on the Consistency of Stakeholder Preferences for Different Types of Information in Evaluating Police Services." Evaluation and Program Planning 9, no. 1 (1986): 13-24.

Dillon, Martin. Assessing Information on the Internet: Toward Providing Library Services for Computer-Mediated Communication (Dublin, Ohio: OCLC Online Computer Library Center, Inc., Office of Research, 1993), OCLC, OCLC-OR-RR-93-1.

Duncan, Joseph W. "The Essentialities of Productivity in Information Services." Information Society 8, no. 2 (April/June 1992): 77-82.

Dyer, Elizabeth. "The Delphi Technique in Library Research." Library Research 1 (1979): 41-52.

Earle, Allan. "Hacker Heaven." Canadian Business 66, no. 12 (December 1993): 63-65.

Farley, L. (1991), Library Resources on the Internet: Strategies for Selection and Use, [Online]. Available FTP: ftp.unt.edu Directory: library File: libcat-guide

Friedrich, Adele E. Competencies for the Information Professional in the Coming Decade: A Delphi Study." Ph.D. diss., University of Pittsburg, 1985.

Gerber, Cheryl. "Booming Commercial Use Changes Face of Internet." Infoworld 15, no. 15 (April 1993): 1, 38.

Granick, Lois. "Assuring the Quality of Information Dissemination: Responsibilities of Database Producers." Information Services and Use 11, no. 3 (May 1991): 117-136.

Halpern, D., and M.S. Nilan. "A Step Toward Shifting the Research Emphasis in Information Science from the System to the User: An Empirical Investigation of Source-evaluation Behavior." in Proceedings of the 51st ASIS Annual Meeting, Atlanta, Georgia, October 23-27, 1988, by the American Society for Information Science (American Society for Information Science, 1988), 169-175.

Kalin, Sally W., and Roy Tennant. "Beyond OPACS...The Wealth of Information on the Internet." Database 14, no. 4 (August 1991): 28-33.

Krol, Ed. The Whole Internet: User's Guide and Catalog. Sebastopol, California: O'Reilly and Associates, Inc., 1992.

Ladner, Sharyn J., and Hope N. Tillman. "How Special Librarians Really Use the Internet." Canadian Library Journal 49, no. 3 (June 1992): 211-215.

Large, Andy. "Evaluating Online and CD-ROM Reference Sources." Journal of Librarianship 21 (April 1989): 87-108.

Li, Xia, and Nancy B. Crane. Electronic Style: A Guide to Citing Electronic Information. Westport, Connecticut: Meckler Publishing, 1993.

Linstone , Harold A. and Murray Turoff, eds. The Delphi Method: Techniques and Applications. Reading, Massachusetts: Addison-Wesley Publishing Co., 1975.

McClure, Charles R., William E. Moen and Joe Ryan. "Academic Libraries and the Impact of Internet/NREN: Key Issues and Findings." In ASIS '93: Proceedings of the 56th ASIS Annual Meeting, Columbus, Ohio, October 24-28, 1993, by the American Society for Information Science. Medford, New Jersey: Learned Information, Inc., 1993, 93-103.

Morehead, David R., and William B. Rouse. "Online Assessment of the Value of Information for Searchers of a Bibliographic Data Base." Information Processing and Management 21, no. 2 (1985): 83-101.

Nilan, M.S., R.P. Peek, and H.W. Synder. "A Methodology for Tapping User Evaluation Behaviors: An Exploration of User's Strategy, Source and Information Evaluating." In Proceedings of the 51st ASIS Annual Meeting, Atlanta, Georgia, October 23-27, 1988, by the American Society for Information Science: American Society for Information Science, 1988, 152-159.

Regazzi, John J. "Performance Measures for Information Retrieval Systems--An Experimental Approach." Journal of the American Society for Information Science 39, no. 4 (July 1988): 235-251.

Rocheleau, Bruce. "Evaluating Public Sector Information Systems: Satisfaction Versus Impact." Evaluation and Program Planning 16, no. 2 (April/June 1993): 119-129.

Sorensen, Kai Arthur. "A Delphi Analysis of the Gero-Communications Needs of the Aged in Marquette County, Michigan." Ph.D. diss., Kent State University, 1977.

Special Libraries Association. "SLA Cleveland Chapter Membership Directory." Cleveland, Ohio: Sherwin-Williams Company, 1993.

Stanton, D. E. (1991). Libraries and Information Resources Networks: A Bibliography, [Online]. Available FTP: csuvax1.csu.murdoch.edu.au Directory: pub/library File: Stanton.bib

Su, Louise T. "Is Relevance an Adequate Criterion for Retrieval Systems: Satisfaction Versus Impact." In ASIS '93: Proceedings of the 56th ASIS Annual Meeting, Columbus, Ohio, October 24-28, 1993, by the American Society for Information Science. Medford, New Jersey: Learned Information, Inc., 1993, 93-103.

Taylor, Robert S. Value-Added Processes in Information Systems. Norwood, New Jersey: Ablex Publishing Corp., 1986.

Turabian, Kate L. A Manual for Writers of Term Papers, Theses, and Dissertations. 5th ed. Revised and Expanded by Bonnie Birtwistle Honigsblum. Chicago: The University of Chicago Press, 1987.

Wang, Peiling, and Dagobert Soergel. "Beyond Topical Relevance: Document Selection Behavior of Real Users of IR Systems." In ASIS '93: Proceedings of the 56th ASIS Annual Meeting, Columbus, Ohio, October 24-28, 1993, by the American Society for Information Science. Medford, New Jersey: Learned Information, Inc., 1993, 87-90.

Wanner, Gail. "Using Internet: Benefits to a Corporation." In 13th National Online Meeting: Proceedings 1992, by the National Online Meeting. Medford, New Jersey: Learned Information, Inc., 1992, 417-426.

Webster's New Collegiate Dictionary, 1975 ed. S.V. "Efficiency."

Yanoff, S. (1994), Special Internet Connections, [Online]. Available FTP: csd4.csd.uwm.edu Directory: pub File: inet.services.txt

Zmud, Robert W. "An Empirical Investigation of the Dimensionality of the Concept of Information." Decision Sciences 9, no. 2 (1978): 187-195.

# APPENDIX A

## INITIAL E-MAIL POSTING TO SOLICIT PARTICIPANTS

August 24, 1994

Dear Colleagues;

I am a graduate student in the School of Library and Information Science at Kent State University. I am writing to solicit participants in an approved study which will help to develop evaluation guidelines for Business Resources on the Internet. Individuals from U.S. Special Libraries and Corporations are being considered as participants, even though emphasis is being placed on business resource evaluation.

If you would like to volunteer to participate in this study, please send your e-mail and business address to the researcher: Kelly Heidman (kheidman@kentvm.kent.edu)

Upon receipt of your e-mail message, a packet of materials detailing the study will be sent to you via regular mail. This invitation is the only part of this study which will be conducted via e-mail, barring unforeseen problems which may arise.

There is no penalty of any kind if you choose not to participate in this study or if you would withdraw from participation at any time. Questions regarding this study may also be directed to the research advisor, Julie Gedeon, School of Library and Information Science, Kent State University, Kent, OH 44242; telephone: (216) 672-2782; e-mail: jgedeon@kentvm.kent.edu

Thank you for your time and I look forward to hearing from you.

Kelly Heidman
Graduate Student
School of Library and Information Science
Kent State University
Kent, OH 44242
e-mail: kheidman@kentvm.kent.edu

# APPENDIX B

# PRELIMINARY QUESTIONNAIRE TO IDENTIFY EXPERTS

RE: A Delphi Study to Ascertain Evaluation Guidelines for Business Resources on the Internet

August, 1994

Dear Colleague:

This preliminary form has been sent in response to your e-mail message conveying an interest to participate in this study. I am a graduate student in the School of Library and Information Science at Kent State University. As part of the requirements for my master's degree I am conducting a study to develop evaluation guidelines for business resources available through the Internet. The enclosed questionnaire is designed to elicit information regarding your experience with the Internet. The responses will then be reviewed and experts chosen from the qualified pool. This study seeks to discover those qualities which special libraries and businesses deem important with regards to their information needs and the Internet. Ultimately, a set of benchmarks will be compiled against which these users can evaluate business resources available through the networks.

Confidentiality and anonymity are guaranteed, as only the investigator has access to the survey data. For selection purposes, you will need to sign this preliminary questionnaire. There is no penalty of any kind if you should choose not to participate in this study or if you would withdraw from participation at any time. While your cooperation is essential to the success of this study, it is, of course, voluntary. A copy of the final results will be available upon request.

If you have any further questions, please contact me at (216) 336-0108, e-mail KHeidman@Kentvm.kent.edu, or Julie Gedeon, my research advisor, at (216) 672-2782. If you have any further questions regarding research at kent State University you may contact Dr. Eugene Wenninger, Office of Research and Sponsored Programs, at (216) 672-2851.

Thank you very much for your cooperation and time; it is much appreciated. You may return the questionnaire in the enclosed self-addressed stamped envelope.

Sincerely.

Kelly Heidman
Graduate Student

PRELIMINARY DATA

Please indicate your responses to the following questions by circling the correct choice for your circumstance. Please call the researcher at (216) 336-0108 or send e-mail to KHEIDMAN@KENTVM.KENT.EDU if you have any questions regarding this questionnaire.

USER IDENTIFICATION

1. I am currently using the Internet in a special library setting.
The user is working in one of the libraries classed in the subject index of the SLA Membership Directory. (See attached Note 1)

2. I am currently using the Internet in a corporate setting.
The user is working in a business setting but the information center or place of use is not officially labelled as a library by the corporation.

3. Other-please explain.

EXPERIENCE/BACKGROUND

Please indicate how you view your professional position by circling the appropriate choice.

1. Information Specialist
2. Librarian
3. Chief Information Officer
4. Information Scientist
5. Corporate Executive
6. Information Broker
7. Systems Analyst
8. Consultant
9. Database Manager
10. Market Researcher
11. Combination of any of the above_____ (use numbers indicated above).
11. Other--please specify_____

Please select the most appropriate response to the following questions dealing with your experience and the Internet.

1. Experience:

   I have used or been involved with the Internet
   a. More than five years.
   b. More than two years but less than five years.
   c. One to two years.
   d. Less than one year.

2. Services performed (FTP, Gopher, Etc.):
   I utilize FTP, Gopher, Telnet, or similar services
   a. More than twice per day.
   b. Once or twice per day.
   c. Once or twice per week.
   d. Once per month.

3. E-Conferences, journals used or moderated:
   I subscribe to and/or moderate
   a. More than one e-conference or journal.
   b. Only one conference or journal.
   c. I do not subscribe to or moderate any journal or conference.

4. Type of use (Research, E-Mail, Etc.)
   Please list how you typically use the Internet currently.

List here any issue which you feel might be important for identification of the expert panelists that was not included in the questions above.

NOTE 1 SPECIAL LIBRARY DESIGNATIONS--Classed by subject[27]

1. Accounting
2. Acid Rain
3. Advanced Measurement
4. Advertising
5. Aeronautical/ Aerospace Propulsion
6. Aerospace
7. Agrochemicals
8. Allied
9. Aluminum
10. Anthropology
11. Archaeology
12. Art History
13. Astronomy
14. Atlases
15. Automation Vendor
16. Automotive
17. Automotive Industry
18. Banking
19. Batteries
20. Biochemistry
21. Botany
22. Business
23. Business--Japanese
24. Carbon and Graphite
25. Cement
26. Ceramics
27. Chemical Engineering
28. Chemical Processes
29. Chemical Industries
30. Chemistry
31. Coatings
32. College Bookstores
33. Colloid/Surface Science
34. Competitive Intelligence
35. Computer Science
36. Computers
37. Concrete
38. Consultant
39. Corporate Fundraising
40. Databases
41. Die Casting
42. Economics
43. Electric Power
44. Electrical Engineering
45. Electrochemistry
46. Electromagnetic Fields
47. Electronic Engineering
48. Electronic Materials
49. Employee Benefits
50. Emulsion Polymerization
51. Energy
52. Engineering
53. Environment
54. Environmental Biology
55. Environmental Education
56. Federal Case Law
57. Ferralloys Industry
58. Finance
59. Flower Arranging
60. Foundation Fundraising
61. Gardening
62. Gazetteers
63. Government Purchasing
64. Guidance and Control
65. Health
66. Heat Transfer
67. Herbs
68. High-Temperature Ceramic Materials
69. Horticulture
70. Independent Contractor
71. Information Systems
72. Information Technology
73. Inorganic Chemistry
74. Investment
75. Iron Industry
76. Landscape Architecture
77. Law
78. Legal Practice
79. Library Management
80. Lighting Technology
81. Management
82. Manufacturing Technology
83. Maps
84. Market Research
85. Marketing
86. Materials
87. Materials Science
88. Mechanical Engineering
89. Medicine

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[27]SLA, "SLA Cleveland Chapter Membership Directory" (Cleveland, Oh: Sherwin-Williams Company, 1993), 80-91.

90. Metals
91. Metals/Materials
92. Museology
93. Natural Gas
94. Natural Gas Utilization
95. Natural History
96. Newspaper Library
97. Newspapers (domestic)
98. Nondestructive Evaluation
99. Nonferrous Metallurgy
100. Nonprofit Management
101. Nursing
102. Ohio Case Law
103. Optics
104. Overhead and Underground Distribution
105. Paints
106. Paleontology
107. Personnel Management
108. Petroleum
109. Philanthropy
110. Photographs
111. Physics
112. Plastics
113. Pole Line Hardware
114. Polymer Chemistry
115. Polymers
116. Power
117. Recruitment Advertising
118. Recruitment Markets
119. Recruitment Media
120. Research and Development
121. Rubber
122. Rubber Business
123. Rubber Chemistry
124. Rubber Technology
125. Sales
126. Science
127. Semiconductors
128. Simulators
129. Space Communications
130. Standards
131. Steel Industry
132. Strategic Planning
133. Structural Mechanics
134. Sulfur Chemistry
135. Tax
136. Technology
137. Thermoplastic Elastomers
138. Toxicity
139. Toxicology
140. Training
141. Transportation
142. Water-Soluble Polymers
143. Weapons Systems
144. Welding
145. Zoology

# APPENDIX C

## DELPHI QUESTIONNAIRE ONE

Dear Colleague:

I am a graduate student in the School of Library and Information Science at Kent State University. You have been selected as an expert for a study which will help develop evaluation guidelines for business resources on the Internet. This investigation will be conducted in the fall using the Delphi method.

Individuals from all special libraries, universities and corporations were considered for candidates, even though emphasis was placed on business resource evaluation. Further discussion of the rationale, methodology and time commitment are contained in the outline of the study which follows.

I am aware that limitations of work, travel and other activities may conflict with this project, but the time commitments on your part are minimal. I believe the outcomes will compensate you for your time and effort. Your input is highly valued, and I can assure you every effort will be made by the researcher to accommodate your schedule.

Confidentiality and anonymity are guaranteed as only the investigator has access to the survey data. For tabulation purposes, you will need to sign the questionnaires. There is no penalty of any kind if you choose not to participate in this study or if you would withdraw from participation at any time. While your cooperation is essential to the success of this study, it is, of course, voluntary.

Please review the overview of this study contained in the outline, complete the enclosed first round packet, and return the packet in the self-addressed stamped envelope within one week of receipt. Questions may be sent to the researcher through the following phone number or e-mail address: (216) 336-0108 or KHeidman@kentvm.kent.edu or you may contact Julie Gedeon, my research advisor, at (216) 672-2782. If you have any further questions regarding research at Kent State University you may contact Dr. Eugene Wenninger, Office of Research and Sponsored Programs, at (216) 672-2851.

Thank you for your time and consideration. I look forward to hearing from you.

Sincerely,

Kelly Heidman

## OUTLINE OF THE STUDY

Project Title:

A Delphi Study to Ascertain Evaluation Guidelines for Business Resources on the Internet.

Rationale:

The Internet is a group of interconnected networks offering great opportunities for network information resources. The very characteristics which are presented as the strengths of the network also illustrate the weaknesses. The amount of information available throughout the networks is growing exponentially, while quality of information has yet to be addressed. Information overload is traditionally handled by weeding out the inferior resources. To date, there are no guidelines established to evaluate these resources from the conventional standpoints regularly applied to print resources. Furthermore, there is evidence that the approaches used to evaluate print or other electronic forms of information will not be adequate for this medium.

It is the intention of this study to acquire a consensus from experts as to the use and needs of businesses, special libraries and universities with regards to their information supply and the Internet. The identification of these needs will be combined with evaluation criteria to establish guidelines for identifying and assessing valuable resources on the Internet for these users.

Methodology:

A modified Delphi will be used to collect data for this study. Delphi is a procedure for soliciting opinions and collating ideas using a series of sequential questionnaires and summarized feedback.

The Delphi has three rounds of questionnaires. The first round will ask you to identify your present situation relating to information needs, criteria for evaluation, and your use of Internet business resources. Round two will summarize the results, and ask for consensus on the additions obtained in round one. Round three will summarize the data presented and ask for a final synopsis of necessary elements to be included in the established set of guidelines.

Expected Outcomes:

The results will provide substantive research in the area of assessing Internet resources. The guidelines will enable efficient use of network resources and increase the competitive edge for the user groups.

Time Consumption:

The estimated time of completion for the first round should be 30 minutes. Second and third rounds may require one

hour each. The time period allotted, however, for return of the questionnaires is one week.

QUESTIONNAIRE #1

INTERNET GUIDELINES: DELPHI ROUND 1

The objective of this first questionnaire is to develop a list of statements which identify areas of use on the Internet, information needs and current evaluation techniques. Review of interdisciplinary literature was performed to obtain the issues represented in this round. An agreement scale, identical to the one presented below, will be used in this questionnaire.

INSTRUCTIONS

Please indicate by <u>circling the number</u> on the scale, as to whether you agree or disagree with the statement.

Strongly Agree 1 2 3 4 5 Strongly Disagree

| | | |
|---|---|---|
| 1= | Strongly Agree | This issue is a vital consideration in information needs, use or evaluation. |
| 2= | Agree | I agree somewhat that this issue is important, but it is not vital. |
| 3= | Neutral | I am neutral on this issue. I am not sure if this is important at all. |
| 4= | Disagree | I disagree that this issue is important for consideration. |
| 5= | Strongly Disagree | I strongly disagree that this issue is important to include for consideration. |

A "Comments" section appears following the issues presented. Please make a notation in this column if you feel any issue is unclear, demonstrates a bias, or needs revision in any way. An "Additions" section appears following the "Comments". List any revisions or additions to the list which you feel are needed but were not represented in this section.
Please return your questionnaire in the envelope provided.

A. INFORMATION--USER EVALUATION AND SELECTION

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Credibility of the information provider is a factor which affects my choice of resources. | STRONGLY AGREE | 1 | 2 | 3 | 4 | 5 STRONGLY DISAGREE |
| 2. | The depth or scope of the information obtained affects my choice of resources. | | 1 | 2 | 3 | 4 | 5 |
| 3. | The extent to which the information is accurate and valid affects my choice of resources. | | 1 | 2 | 3 | 4 | 5 |
| 4. | The ability for information to be obtained consistently and conveniently from one source affects my choice of resources. | | 1 | 2 | 3 | 4 | 5 |
| 5. | The extent of the clarity and readability of the information affects my choice of resources. | | 1 | 2 | 3 | 4 | 5 |
| 6. | The currency of the information affects my choice of resources. | | 1 | 2 | 3 | 4 | 5 |
| 7. | The ability of the searcher to understand the information provided affects my choice of resources. | | 1 | 2 | 3 | 4 | 5 |
| 8. | The ability of the users (the clients) to understand the information provided affects my choice of resources. | | 1 | 2 | 3 | 4 | 5 |
| 9. | The uniqueness of the material available affects my choice of resources. | | 1 | 2 | 3 | 4 | 5 |
| 10. | The uniqueness of the information resource affects my choice of resources. | | 1 | 2 | 3 | 4 | 5 |
| 11. | When searching for information, the possible reference value for future use is an important factor to consider. | | 1 | 2 | 3 | 4 | 5 |
| 12. | The extent to which information is available through more than one source affects my choice of resources. | | 1 | 2 | 3 | 4 | 5 |
| 13. | The ease of access to information affects my choice of resources. | | 1 | 2 | 3 | 4 | 5 |
| 14. | Pertinent information to my search query is an important factor to consider when trying to solve an information need. | | 1 | 2 | 3 | 4 | 5 |
| 15. | Exploring new possibilities for information provision is important when trying to solve an information need. | | 1 | 2 | 3 | 4 | 5 |

B. CURRENT INTERNET EVALUATION

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | Although directories for location of files exist, I know of no evaluative guides to resources that exist on the Internet. | STRONGLY AGREE | 1 | 2 | 3 | 4 | 5 STRONGLY DISAGREE |
| 2. | Evaluation of material available through the Internet is important for it to be valuable to address my information needs. | | 1 | 2 | 3 | 4 | 5 |
| 3. | I know of no groups or experts who scan and retrieve free-access data for accuracy or completeness. | | 1 | 2 | 3 | 4 | 5 |
| 4. | A service that would provide expert evaluation of resources on the Internet would increase the usefulness of the network. | | 1 | 2 | 3 | 4 | 5 |
| 5. | My business or library would consider paying an additional fee for quality reviews of information products and services on the Internet. | | 1 | 2 | 3 | 4 | 5 |
| 6. | I use information available on the Internet to meet many of my information needs. | | 1 | 2 | 3 | 4 | 5 |
| 7. | I use information available through the Internet, without guarantees of accuracy or completeness, and look for a secondary source to support the information. | | 1 | 2 | 3 | 4 | 5 |
| 8. | I use the Internet primarily for communication with colleagues (e-mail), and do not access specific information resources on the Internet. | | 1 | 2 | 3 | 4 | 5 |

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|---|---|---|---|---|---|---|
| 9. | Using the Internet for information sources, exchange or supply increases my work efficiency. | 1 | 2 | 3 | 4 | 5 |
| 10. | Aside from commercial vendors, I know of no group that requires a standard of quality before information can be posted. (Excluding moderated lists) | 1 | 2 | 3 | 4 | 5 |
| 11. | Quantity of information is important for for my information needs. | 1 | 2 | 3 | 4 | 5 |
| 12. | Information representing a diversity of viewpoints is important for my information needs. | 1 | 2 | 3 | 4 | 5 |

C. INTERNET RESOURCES--USE AND ORGANIZATION

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | I use services like Usenet, or discussion groups to help decipher worthwhile resources. | STRONGLY AGREE | 1 | 2 | 3 | 4 | 5 STRONGLY DISAGREE |
| 2. | Finding tools such as Archie or Veronica are useful for finding information resources on the Internet. | | 1 | 2 | 3 | 4 | 5 |
| 3. | Access tools such as Gopher or Mosiac are useful for finding information resources on the Internet. | | 1 | 2 | 3 | 4 | 5 |
| 4. | The file names representing files within directories accurately represent the data contained within those files. | | 1 | 2 | 3 | 4 | 5 |
| 5. | I judge the relevance of information contained in a file by the file name. | | 1 | 2 | 3 | 4 | 5 |
| 6. | I look for a "readme" file to help evaluate the contents of a particular database. | | 1 | 2 | 3 | 4 | 5 |
| 7. | Indexes of database contents accurately reflect the contents of a database. | | 1 | 2 | 3 | 4 | 5 |
| 8. | I browse the frequently asked questions (FAQs) to see if any information is available regarding evaluation of current resources. | | 1 | 2 | 3 | 4 | 5 |
| 9. | Utilization of network information centers such as InterNIC increases the probability of locating relevant, quality resources. | | 1 | 2 | 3 | 4 | 5 |

COMMENTS:

ADDITIONS:



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APPENDIX D

DELPHI QUESTIONNAIRE ONE - DATA

```
 09:19:51        KENT STATE UNIVERSITY        IBM 4381 R24     VM/CMS 5.0

    1  0  DATA LIST FILE ='NET1 DATA *'  NOTABLE.
    2  0    /1 ID 1-4 QUES1 TO QUES36 5-184
    3  0  FREQUENCIES VAR ALL.
0THERE ARE 4,085,240 BYTES OF MEMORY AVAILABLE.
 THE LARGEST CONTIGUOUS AREA HAS 3,241,504 BYTES.
0MEMORY ALLOWS A TOTAL OF 32,767 VALUES ACCUMULATED ACROSS ALL VARIABLES.
 THERE MAY BE UP TO 8,192 VALUE LABELS FOR EACH VARIABLE.
106-DEC-94    SPSS RELEASE 4.1 FOR IBM VM/CMS

 09:19:51        KENT STATE UNIVERSITY        IBM 4381 R24     VM/CMS 5.0

0ID

0
 VALUE LABEL                 VALUE  FREQUENCY  PERCENT  VALID PERCENT  CUM PERCENT

                                 1          1      4.0            4.0          4.0
                                 2          1      4.0            4.0          8.0
                                 3          1      4.0            4.0         12.0
                                 4          1      4.0            4.0         16.0
                                 5          1      4.0            4.0         20.0
                                 6          1      4.0            4.0         24.0
                                 7          1      4.0            4.0         28.0
                                 8          1      4.0            4.0         32.0
                                 9          1      4.0            4.0         36.0
                                10          1      4.0            4.0         40.0
                                11          1      4.0            4.0         44.0
                                12          1      4.0            4.0         48.0
                                13          1      4.0            4.0         52.0
                                14          1      4.0            4.0         56.0
                                15          1      4.0            4.0         60.0
                                16          1      4.0            4.0         64.0
                                17          1      4.0            4.0         68.0
                                18          1      4.0            4.0         72.0
                                19          1      4.0            4.0         76.0
                                20          1      4.0            4.0         80.0
                                21          1      4.0            4.0         84.0
                                22          1      4.0            4.0         88.0
                                23          1      4.0            4.0         92.0
                                24          1      4.0            4.0         96.0
                                25          1      4.0            4.0        100.0
                                        -------  -------        -------
                             TOTAL         25    100.0          100.0
VALID CASES       25      MISSING CASES       0
106-DEC-94    SPSS RELEASE 4.1 FOR IBM VM/CMS

 09:19:51        KENT STATE UNIVERSITY        IBM 4381 R24     VM/CMS 5.0

QUES1
                                                              VALID       CUM
 VALUE LABEL                 VALUE  FREQUENCY  PERCENT  VALID PERCENT  CUM PERCENT

                                 1         16     64.0           64.0         64.0
                                 2          7     28.0           28.0         92.0
                                 3          1      4.0            4.0         96.0
                                 4          1      4.0            4.0        100.0
                                        -------  -------        -------
                             TOTAL         25    100.0          100.0
VALID CASES       25      MISSING CASES       0

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
QUES2
                                                              VALID       CUM
 VALUE LABEL                 VALUE  FREQUENCY  PERCENT  VALID PERCENT  CUM PERCENT

                                 1         11     44.0           44.0         44.0
                                 2         10     40.0           40.0         84.0
                                 3          4     16.0           16.0        100.0
                                        -------  -------        -------
                             TOTAL         25    100.0          100.0
0VALID CASES      25      MISSING CASES       0

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
QUES3
                                                              VALID       CUM
 VALUE LABEL                 VALUE  FREQUENCY  PERCENT  VALID PERCENT  CUM PERCENT

                                 1         20     80.0           80.0         80.0
                                 2          4     16.0           16.0         96.0
                                 3          1      4.0            4.0        100.0
                                        -------  -------        -------
                             TOTAL         25    100.0          100.0
```

VALID CASES 25 MISSING CASES 0

QUES4

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 10 | 40.0 | 40.0 | 40.0 |
| | 2 | 11 | 44.0 | 44.0 | 84.0 |
| | 3 | 3 | 12.0 | 12.0 | 96.0 |
| | 4 | 1 | 4.0 | 4.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES5

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 9 | 36.0 | 36.0 | 36.0 |
| | 2 | 11 | 44.0 | 44.0 | 80.0 |
| | 3 | 3 | 12.0 | 12.0 | 92.0 |
| | 4 | 2 | 8.0 | 8.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES6

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 12 | 48.0 | 48.0 | 48.0 |
| | 2 | 8 | 32.0 | 32.0 | 80.0 |
| | 3 | 4 | 16.0 | 16.0 | 96.0 |
| | 4 | 1 | 4.0 | 4.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES7

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 0 | 1 | 4.0 | 4.0 | 4.0 |
| | 1 | 6 | 24.0 | 24.0 | 28.0 |
| | 2 | 14 | 56.0 | 56.0 | 84.0 |
| | 3 | 4 | 16.0 | 16.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES8

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 11 | 44.0 | 44.0 | 44.0 |
| | 2 | 7 | 28.0 | 28.0 | 72.0 |
| | 3 | 6 | 24.0 | 24.0 | 96.0 |
| | 4 | 1 | 4.0 | 4.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES9

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 5 | 20.0 | 20.0 | 20.0 |
| | 2 | 11 | 44.0 | 44.0 | 64.0 |
| | 3 | 7 | 28.0 | 28.0 | 92.0 |
| | 4 | 2 | 8.0 | 8.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES10

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 5 | 20.0 | 20.0 | 20.0 |
| | 2 | 8 | 32.0 | 32.0 | 52.0 |
| | 3 | 8 | 32.0 | 32.0 | 84.0 |
| | 4 | 3 | 12.0 | 12.0 | 96.0 |

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| | | | | | |
|---|---|---|---|---|---|
| | 5 | 1 | 4.0 | 4.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |
| VALID CASES 25 | MISSING CASES 0 | | | | |

QUES11

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 0 | 1 | 4.0 | 4.0 | 4.0 |
| | 1 | 6 | 24.0 | 24.0 | 28.0 |
| | 2 | 9 | 36.0 | 36.0 | 64.0 |
| | 3 | 7 | 28.0 | 28.0 | 92.0 |
| | 4 | 2 | 8.0 | 8.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |
| VALID CASES 25 | MISSING CASES 0 | | | | |

QUES12

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 7 | 28.0 | 28.0 | 28.0 |
| | 2 | 7 | 28.0 | 28.0 | 56.0 |
| | 3 | 7 | 28.0 | 28.0 | 84.0 |
| | 4 | 4 | 16.0 | 16.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |
| VALID CASES 25 | MISSING CASES 0 | | | | |

QUES13

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 12 | 48.0 | 48.0 | 48.0 |
| | 2 | 8 | 32.0 | 32.0 | 80.0 |
| | 3 | 5 | 20.0 | 20.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |
| VALID CASES 25 | MISSING CASES 0 | | | | |

QUES14

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 0 | 1 | 4.0 | 4.0 | 4.0 |
| | 1 | 18 | 72.0 | 72.0 | 76.0 |
| | 2 | 6 | 24.0 | 24.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |
| VALID CASES 25 | MISSING CASES 0 | | | | |

QUES15

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 9 | 36.0 | 36.0 | 36.0 |
| | 2 | 10 | 40.0 | 40.0 | 76.0 |
| | 3 | 3 | 12.0 | 12.0 | 88.0 |
| | 4 | 3 | 12.0 | 12.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |
| VALID CASES 25 | MISSING CASES 0 | | | | |

QUES16

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 11 | 44.0 | 44.0 | 44.0 |
| | 2 | 2 | 8.0 | 8.0 | 52.0 |
| | 3 | 2 | 8.0 | 8.0 | 60.0 |
| | 4 | 7 | 28.0 | 28.0 | 88.0 |
| | 5 | 3 | 12.0 | 12.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |
| VALID CASES 25 | MISSING CASES 0 | | | | |

QUES17

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| | 1 | 9 | 36.0 | 36.0 | 36.0 |
| | 2 | 8 | 32.0 | 32.0 | 68.0 |
| | 3 | 7 | 28.0 | 28.0 | 96.0 |
| | 4 | 1 | 4.0 | 4.0 | 100.0 |
| TOTAL | | 25 | 100.0 | 100.0 | |
| VALID CASES 25 | MISSING CASES | 0 | | | |

QUES18

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 0 | 1 | 4.0 | 4.0 | 4.0 |
| | 1 | 13 | 52.0 | 52.0 | 56.0 |
| | 2 | 2 | 8.0 | 8.0 | 64.0 |
| | 3 | 2 | 8.0 | 8.0 | 72.0 |
| | 4 | 5 | 20.0 | 20.0 | 92.0 |
| | 5 | 2 | 8.0 | 8.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |
| VALID CASES 25 | MISSING CASES | 0 | | | |

QUES19

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 14 | 56.0 | 56.0 | 56.0 |
| | 2 | 9 | 36.0 | 36.0 | 92.0 |
| | 3 | 1 | 4.0 | 4.0 | 96.0 |
| | 4 | 1 | 4.0 | 4.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |
| VALID CASES 25 | MISSING CASES | 0 | | | |

QUES20

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 1 | 4.0 | 4.0 | 4.0 |
| | 2 | 13 | 52.0 | 52.0 | 56.0 |
| | 3 | 6 | 24.0 | 24.0 | 80.0 |
| | 4 | 3 | 12.0 | 12.0 | 92.0 |
| | 5 | 2 | 8.0 | 8.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |
| VALID CASES 25 | MISSING CASES | 0 | | | |

QUES21

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 9 | 36.0 | 36.0 | 36.0 |
| | 2 | 10 | 40.0 | 40.0 | 76.0 |
| | 3 | 4 | 16.0 | 16.0 | 92.0 |
| | 4 | 1 | 4.0 | 4.0 | 96.0 |
| | 5 | 1 | 4.0 | 4.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |
| VALID CASES 25 | MISSING CASES | 0 | | | |

QUES22

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 5 | 20.0 | 20.0 | 20.0 |
| | 2 | 11 | 44.0 | 44.0 | 64.0 |
| | 3 | 7 | 28.0 | 28.0 | 92.0 |
| | 4 | 2 | 8.0 | 8.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |
| VALID CASES 25 | MISSING CASES | 0 | | | |

QUES23

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 3 | 12.0 | 12.0 | 12.0 |
| | 2 | 3 | 12.0 | 12.0 | 24.0 |
| | 4 | 14 | 56.0 | 56.0 | 80.0 |
| | 5 | 5 | 20.0 | 20.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |



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VALID CASES 25 MISSING CASES 0

QUES24

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 11 | 44.0 | 44.0 | 44.0 |
| | 2 | 7 | 28.0 | 28.0 | 72.0 |
| | 3 | 3 | 12.0 | 12.0 | 84.0 |
| | 4 | 4 | 16.0 | 16.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES25

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 7 | 28.0 | 28.0 | 28.0 |
| | 2 | 6 | 24.0 | 24.0 | 52.0 |
| | 3 | 6 | 24.0 | 24.0 | 76.0 |
| | 4 | 5 | 20.0 | 20.0 | 96.0 |
| | 5 | 1 | 4.0 | 4.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES26

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 6 | 24.0 | 24.0 | 24.0 |
| | 2 | 4 | 16.0 | 16.0 | 40.0 |
| | 3 | 8 | 32.0 | 32.0 | 72.0 |
| | 4 | 5 | 20.0 | 20.0 | 92.0 |
| | 5 | 2 | 8.0 | 8.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES27

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 5 | 20.0 | 20.0 | 20.0 |
| | 2 | 6 | 24.0 | 24.0 | 44.0 |
| | 3 | 9 | 36.0 | 36.0 | 80.0 |
| | 4 | 3 | 12.0 | 12.0 | 92.0 |
| | 5 | 2 | 8.0 | 8.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES28

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 8 | 32.0 | 32.0 | 32.0 |
| | 2 | 12 | 48.0 | 48.0 | 80.0 |
| | 3 | 4 | 16.0 | 16.0 | 96.0 |
| | 5 | 1 | 4.0 | 4.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES29

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 15 | 60.0 | 60.0 | 60.0 |
| | 2 | 3 | 12.0 | 12.0 | 72.0 |
| | 3 | 5 | 20.0 | 20.0 | 92.0 |
| | 4 | 1 | 4.0 | 4.0 | 96.0 |
| | 5 | 1 | 4.0 | 4.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES30

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 18 | 72.0 | 72.0 | 72.0 |
| | 2 | 5 | 20.0 | 20.0 | 92.0 |
| | 3 | 2 | 8.0 | 8.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES31

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 2 | 1 | 4.0 | 4.0 | 4.0 |
| | 3 | 9 | 36.0 | 36.0 | 40.0 |
| | 4 | 7 | 28.0 | 28.0 | 68.0 |
| | 5 | 8 | 32.0 | 32.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES32

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 2 | 2 | 8.0 | 8.0 | 8.0 |
| | 3 | 5 | 20.0 | 20.0 | 28.0 |
| | 4 | 7 | 28.0 | 28.0 | 56.0 |
| | 5 | 11 | 44.0 | 44.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES33

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 11 | 44.0 | 44.0 | 44.0 |
| | 2 | 11 | 44.0 | 44.0 | 88.0 |
| | 3 | 1 | 4.0 | 4.0 | 92.0 |
| | 4 | 1 | 4.0 | 4.0 | 96.0 |
| | 5 | 1 | 4.0 | 4.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES34

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 2 | 4 | 16.0 | 16.0 | 16.0 |
| | 3 | 9 | 36.0 | 36.0 | 52.0 |
| | 4 | 8 | 32.0 | 32.0 | 84.0 |
| | 5 | 4 | 16.0 | 16.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES35

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 4 | 16.0 | 16.0 | 16.0 |
| | 2 | 8 | 32.0 | 32.0 | 48.0 |
| | 3 | 9 | 36.0 | 36.0 | 84.0 |
| | 4 | 3 | 12.0 | 12.0 | 96.0 |
| | 5 | 1 | 4.0 | 4.0 | 100.0 |
| | TOTAL | 25 | 100.0 | 100.0 | |

VALID CASES 25 MISSING CASES 0

QUES36

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 0 | 1 | 4.0 | 4.0 | 4.0 |
| | 1 | 7 | 28.0 | 28.0 | 32.0 |
| | 2 | 5 | 20.0 | 20.0 | 52.0 |
| | 3 | 10 | 40.0 | 40.0 | 92.0 |

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| | | | | | | |
|---|---|---|---|---|---|---|
| | | 4 | 2 | 8.0 | 8.0 | 100.0 |
| | | TOTAL | 25 | 100.0 | 100.0 | |
| VALID CASES | 25 | MISSING CASES | 0 | | | |

# APPENDIX E

## DELPHI ROUND ONE - SUMMARY

Dear Colleague:

My apologies for the amount of time it has taken to get the second round of questions to you for my study "A Delphi Study to Ascertain Evaluation Guidelines for Business Resources on the Internet."

I have included a summary of the results of the first round which you may keep. Because of the homogeneous nature of the respondent population and the overall consensus of ratings for the majority of items, the second round will now be the final round.

Included with the second questionnaire is an explanation of the round along with instructions.

Please return the questionnaire within one week of receipt in the enclosed self-addressed stamped envelope. Thank you for your participation and I will be sending all participants final results and summaries.

Sincerely,

Kelly R. Heidman

Summary of Round One

The objective of the first questionnaire was to obtain your judgments as to current information evaluation and organizational tools/resources on the Internet as they pertain to business sources. A five point scale was used to measure your responses, ranging from "1 - Strongly Agree" to "5 Strongly Disagree."

Data analysis was performed by taking each response for every item and determining the "average score" for each statement. The mean score was determined by assigning a weight to each possible numbered response.

Weights were as follows:

| Response | Weight |
|---|---|
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |

Total weights for each statement were divided by the number of responses for that item. If the item was not answered by all participants, it was divided by the number of those who did respond.

Items which were retained in this round maintained an average score of 2.00 or higher, or 3.00 and lower. These statements identified those items which were had either strong agreement or strong disagreement.

ROUND ONE DATA ANALYSIS

| ITEM | AVERAGE SCORE |
|---|---|
| Credibility of the information provider is a factor which affects my choice of resources. | 1.28 |
| The depth or scope of the information obtained affects my choice of resources. | 1.72 |
| The extent to which the information is accurate and valid affects my choice of resources. | 1.24 |
| The ability for information to be obtained consistently and conveniently from one source affects my choice of resources. | 1.80 |
| The extent of the clarity and readability of the information affects my choice of resources. | 1.92 |
| The currency of the information affects my choice of resources. | 1.76 |
| The ability of the searcher to understand the information provided affects my choice of resources. | 1.91 |
| The ability of the users (the clients) to understand the information provided affects my choice of resources. | 1.88 |
| The ease of access to information affects my choice of resources. | 1.72 |
| Pertinent information to my search query is an important factor to consider when trying to solve an information need. | 1.25 |
| Exploring new possibilities for information provision is important when trying to solve an information need. | 2.00 |
| Evaluation of material available through the Internet is important for it to be valuable to address my information needs. | 2.00 |
| A service that would provide expert evaluation of resources on the Internet would increase the usefulness of the network. | 1.56 |
| I use information available on the Internet to meet many of my information needs. | 2.00 |
| I use the Internet primarily for communication with colleagues (e-mail), and do not access specific information resources on the Internet. | 3.60 |
| Using the Internet for information sources, exchange or supply increases my work efficiency. | 2.00 |



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| | |
|---|---|
| I use services like Usenet, or discussion groups to help decipher worthwhile resources. | 1.96 |
| Finding tools such as Archie or Veronica are useful for finding information resources on the Internet. | 1.80 |
| Access tools such as Gopher or Mosiac are useful for finding information resources on the Internet. | 1.36 |
| The file names representing files within directories accurately represent the data contained within those files. | 3.88 |
| I judge the relevance of information contained in a file by the file name. | 4.08 |
| I look for a "readme" file to help evaluate the contents of a particular database. | 1.80 |
| Indexes of database contents accurately reflect the contents of a database. | 3.48 |

YOU MAY KEEP THESE RESULTS. RETURN ONLY THE QUESTIONNAIRE IN THE ENVELOPE.



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APPENDIX F

DELPHI QUESTIONNAIRE TWO

QUESTIONNAIRE #2

A Delphi Study to Ascertain Evaluation Guidelines for Business resources on the Internet.

The objective of this second and final round is to reach consensus on a list of evaluative criteria and considerations which would be most useful for application to Internet business resources. This study is not designating one particular aspect of business resources, but aims to develop generalized guidelines which can be applied to any type of business-related information.

Items appearing in this round are a combination of revisions from round one along with some of your additions. Original statements from round one were restated as possible solutions or suggestions.

A rating scale appears to the right of each item and is identical to that which was used in round one. Please indicate which response most closely matches your point of view by circling the appropriate number. The scale is as follows:

EVALUATIVE SCALE:

1 Strongly Agree
2 Agree
3 Neutral
4 Disagree
5 Strongly Disagree

A space is provided at the end of the questionnaire for any additional comments or suggestions.

When you have completed the questionnaire, please place it in the self-addressed stamped envelope which is provided and mail it within one week after receipt. Thank you again for your time and participation.

| Suggestions/Solutions | Strongly Agree | | | | Strongly Disagree |
|---|---|---|---|---|---|
| 1. A statement regarding the source of the data should be included with the information to establish a credibility factor. | 1 | 2 | 3 | 4 | 5 |
| 2. Prefatory materials relating database/file contents should be added to enable evaluation of depth/scope of materials. | 1 | 2 | 3 | 4 | 5 |
| 3. Business resources available through the Internet should be reinforced by a second source to assist in accuracy. | 1 | 2 | 3 | 4 | 5 |
| 4. A notification as to file availability should be visible at the home page of a server to better assist the searcher in obtaining materials consistently and conveniently from one source. | 1 | 2 | 3 | 4 | 5 |
| 5. Uniform presentation of database/file contents should be established to aid the searcher in obtaining materials consistently and conveniently from one source. | 1 | 2 | 3 | 4 | 5 |
| 6. Data prefaced with a statement of intended audience should be included to aid the searcher with factors of readability. | 1 | 2 | 3 | 4 | 5 |
| 7. Statements of intended audience are not needed because it is the responsibility of the information professional to obtain the appropriate materials for each client. | 1 | 2 | 3 | 4 | 5 |
| 8. Frequency of updates appearing with databases/files should be included to aid the searcher in evaluation of currency. | 1 | 2 | 3 | 4 | 5 |
| 9. A central location with online updates of database contents and intended audience should be established. | 1 | 2 | 3 | 4 | 5 |
| 10. A central location which contained materials on similar issues for a variety of intellectual levels should be established to aid searchers in provision of appropriate information. | 1 | 2 | 3 | 4 | 5 |
| 11. Presentation and current organization of business resources on the Internet is such that anyone in the business environment can navigate successfully through a search. | 1 | 2 | 3 | 4 | 5 |
| 12. Current organization of business resources on the Internet is such that an information specialist should be consulted to obtain the best search results. | 1 | 2 | 3 | 4 | 5 |
| 13. Directories/files containing business resources vary from site to site as to their organization and currently need to be evaluated on an individual basis. | 1 | 2 | 3 | 4 | 5 |
| 14. Directories would be more functional to evaluation if uniformly designed from site to site. | 1 | 2 | 3 | 4 | 5 |
| 15. A panel of catalogers specializing in electronic information organizational patterns should be formed to organize business sources on the Internet. | 1 | 2 | 3 | 4 | 5 |
| 16. Business sources on the Internet are best utilized for ready reference questions (i.e. quick, factual answers). | 1 | 2 | 3 | 4 | 5 |
| 17. Business sources on the Internet are best utilized as supplemental materials to established reference sources. | 1 | 2 | 3 | 4 | 5 |
| 18. Internet business resources can replace traditional print resources. | 1 | 2 | 3 | 4 | 5 |
| 19. Traditional evaluative criteria (i.e. currency, authority, etc.) will be adequate for evaluation of Internet resources. | 1 | 2 | 3 | 4 | 5 |
| 20. Information specialists need to demonstrate the usefulness of the Internet beyond e-mail to their respective user populations. | 1 | 2 | 3 | 4 | 5 |
| 21. Access of Internet business resources to all people within the potential user environment would increase my work efficiency. | 1 | 2 | 3 | 4 | 5 |
| 22. Full Internet access (including Usenet or discussion groups) should be encouraged in any business environment. | 1 | 2 | 3 | 4 | 5 |
| 23. Knowledge in "how best to compose a Veronica query" would increase the effectiveness of this tool. | 1 | 2 | 3 | 4 | 5 |

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| | | | | | | |
|---|---|---|---|---|---|---|
| 24. | To aid in gopher usefulness, control and organization of gopher client/servers should be placed with an information specialist. | 1 | 2 | 3 | 4 | 5 |
| 25. | Thesaurus construction or standardized practices for file names would facilitate the estimation of file contents by file name. | 1 | 2 | 3 | 4 | 5 |
| 26. | Associating subject headings with file names would increase the ability of the searcher to judge the appropriate documents by file name. | 1 | 2 | 3 | 4 | 5 |
| 27. | Sites on the Internet which would be considered as "recommended" should have "readme" files for their directories. | 1 | 2 | 3 | 4 | 5 |
| 28. | Indexes for sites should be more detailed in their presentation to be of help in reflecting database contents. | 1 | 2 | 3 | 4 | 5 |
| 29. | Lists of accessible files available on the Internet which are published by individuals are useful for evaluation of materials. | 1 | 2 | 3 | 4 | 5 |
| 30. | Use of gophers and/or bookmarks is a recommended method of easy access to heavily used sites and materials. | 1 | 2 | 3 | 4 | 5 |

ADDITIONAL COMMENTS/SUGGESTIONS:



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APPENDIX G

DELPHI QUESTIONNAIRE TWO - DATA

```
 16:14:31        KENT STATE UNIVERSITY        IBM 4381 R24
VM/CMS 5.0


    1  0  COMMENT
    2  0     THE "NOTABLE" OPTION IS INCLUDED TO SUPPRESS THE
VARIABLE
    3  0      LISTING OUTPUT. REMOVE "NOTABLE" IF LISTING IS
DESIRED.
    4  0  DATA LIST FILE ='NET2 DATA *' RECORDS = 1 NOTABLE
    5  0   /1 ID 1-4 QUES1 TO QUES30 5-94
    6  0  FREQUENCIES VAR ALL
0THERE ARE 4,196,192 BYTES OF MEMORY AVAILABLE.
 THE LARGEST CONTIGUOUS AREA HAS 3,330,336 BYTES.
0MEMORY ALLOWS A TOTAL OF 32,767 VALUES ACCUMULATED ACROSS ALL
VARIABLES.
 THERE MAY BE UP TO 8,192 VALUE LABELS FOR EACH VARIABLE.
104-MAR-95   SPSS RELEASE 4.1 FOR IBM VM/CMS

 16:14:31        KENT STATE UNIVERSITY        IBM 4381 R24
VM/CMS 5.0

ID

                                                        VALID
   CUM
 VALUE  LABEL                  VALUE   FREQUENCY   PERCENT
PERCENT   PERCENT

                                  1         1       5.9       5.9
    5.9
                                  2         1       5.9       5.9
   11.8
                                  3         1       5.9       5.9
   17.6
                                  4         1       5.9       5.9
   23.5
                                  5         1       5.9       5.9
   29.4
                                  6         1       5.9       5.9
   35.3
                                  7         1       5.9       5.9
   41.2
                                  8         1       5.9       5.9
   47.1
                                  9         1       5.9       5.9
   52.9
                                 10         1       5.9       5.9
   58.8
```

| | | | | |
|---|---|---|---|---|
| 64.7 | 11 | 1 | 5.9 | 5.9 |
| 70.6 | 12 | 1 | 5.9 | 5.9 |
| 76.5 | 13 | 1 | 5.9 | 5.9 |
| 82.4 | 14 | 1 | 5.9 | 5.9 |
| 88.2 | 15 | 1 | 5.9 | 5.9 |
| 94.1 | 16 | 1 | 5.9 | 5.9 |
| 100.0 | 17 | 1 | 5.9 | 5.9 |
| | TOTAL | 17 | 100.0 | 100.0 |

VALID CASES 17 MISSING CASES 0

- - - -

VALID CASES 17 MISSING CASES 0

QUES3

| VALUE | LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|---|
| | | 1 | 5 | 29.4 | 29.4 | 29.4 |
| | | 2 | 4 | 23.5 | 23.5 | 52.9 |
| | | 3 | 6 | 35.3 | 35.3 | 88.2 |
| | | 4 | 2 | 11.8 | 11.8 | 100.0 |
| | TOTAL | | 17 | 100.0 | 100.0 | |

VALID CASES 17 MISSING CASES 0

QUES4

| VALUE | LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|---|
| | | 1 | 4 | 23.5 | 23.5 | 23.5 |
| | | 2 | 7 | 41.2 | 41.2 | 64.7 |
| | | 3 | 5 | 29.4 | 29.4 | 94.1 |
| | | 4 | 1 | 5.9 | 5.9 | 100.0 |
| | TOTAL | | 17 | 100.0 | 100.0 | |

VALID CASES 17 MISSING CASES 0

QUES5

| VALUE | LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|---|

| | | | |
|---|---|---|---|
| 1 | 4 | 23.5 | 23.5 |
| 2 | 6 | 35.3 | 35.3 |
| 3 | 6 | 35.3 | 35.3 |
| 4 | 1 | 5.9 | 5.9 |
| TOTAL | 17 | 100.0 | 100.0 |

VALID CASES 17 MISSING CASES 0

QUES6

| VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|
| 1 | 1 | 5.9 | 5.9 | 5.9 |
| 2 | 5 | 29.4 | 29.4 | 35.3 |
| 3 | 8 | 47.1 | 47.1 | 82.4 |
| 4 | 3 | 17.6 | 17.6 | 100.0 |
| TOTAL | 17 | 100.0 | 100.0 | |

VALID CASES 17 MISSING CASES 0

- - - -

| | | | | |
|---|---|---|---|---|
| | TOTAL | 17 | 100.0 | 100.0 |
| VALID CASES 17 | MISSING CASES 0 | | | |

QUES8

| CUM VALUE LABEL PERCENT | CUM PERCENT | VALUE | FREQUENCY | PERCENT | VALID PERCENT |
|---|---|---|---|---|---|
| | | 1 | 9 | 52.9 | 52.9 |
| 52.9 | | 2 | 7 | 41.2 | 41.2 |
| 94.1 | | 4 | 1 | 5.9 | 5.9 |
| 100.0 | | | 17 | 100.0 | 100.0 |
| VALID CASES 17 | | MISSING CASES 0 | | | |

QUES9

| CUM VALUE LABEL PERCENT | CUM PERCENT | VALUE | FREQUENCY | PERCENT | VALID PERCENT |
|---|---|---|---|---|---|
| | | 2 | 6 | 35.3 | 35.3 |
| 35.3 | | 3 | 7 | 41.2 | 41.2 |
| 76.5 | | 4 | 2 | 11.8 | 11.8 |
| 88.2 | | 5 | 2 | 11.8 | 11.8 |
| 100.0 | | | 17 | 100.0 | 100.0 |
| VALID CASES 17 | | MISSING CASES 0 | | | |

QUES10

| CUM VALUE LABEL PERCENT | CUM PERCENT | VALUE | FREQUENCY | PERCENT | VALID PERCENT |
|---|---|---|---|---|---|
| | | 2 | 6 | 35.3 | 35.3 |
| 35.3 | | | | | |

| | | | | |
|---|---|---|---|---|
| | 3 | 7 | 41.2 | 41.2 |
| 76.5 | | | | |
| | 4 | 3 | 17.6 | 17.6 |
| 94.1 | | | | |
| | 5 | 1 | 5.9 | 5.9 |
| 100.0 | | | | |
| | | ------- | | ------- |
| ------- | | | | |
| | TOTAL | 17 | 100.0 | 100.0 |

VALID CASES 17 MISSING CASES 0

---

QUES11

| CUM VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT |
|---|---|---|---|---|
| | 1 | 1 | 5.9 | 5.9 |
| 5.9 | | | | |
| | 2 | 2 | 11.8 | 11.8 |
| 17.6 | | | | |
| | 3 | 1 | 5.9 | 5.9 |
| 23.5 | | | | |
| | 4 | 8 | 47.1 | 47.1 |
| 70.6 | | | | |
| | 5 | 5 | 29.4 | 29.4 |
| 100.0 | | | | |
| | | ------- | | ------- |
| ------- | | | | |
| | TOTAL | 17 | 100.0 | 100.0 |

VALID CASES 17 MISSING CASES 0

- - - -

VALID CASES 17 MISSING CASES 0

- - - -

| | | | | |
|---|---|---|---|---|
| | 1 | 2 | 11.8 | 11.8 |
| 11.8 | | | | |
| | 2 | 4 | 23.5 | 23.5 |
| 35.3 | | | | |
| | 3 | 2 | 11.8 | 11.8 |
| 47.1 | | | | |
| | 4 | 5 | 29.4 | 29.4 |
| 76.5 | | | | |
| | 5 | 4 | 23.5 | 23.5 |
| 100.0 | | | | |
| | | 17 | 100.0 | 100.0 |

VALID CASES 17 MISSING CASES 0

QUES16

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 0 | 1 | 5.9 | 5.9 | |
| 5.9 | | | | | |
| | 1 | 1 | 5.9 | 5.9 | |
| 11.8 | | | | | |
| | 2 | 4 | 23.5 | 23.5 | |
| 35.3 | | | | | |
| | 3 | 8 | 47.1 | 47.1 | |
| 82.4 | | | | | |
| | 4 | 3 | 17.6 | 17.6 | |
| 100.0 | | | | | |
| | | 17 | 100.0 | 100.0 | |

VALID CASES 17 MISSING CASES 0

QUES17

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 3 | 17.6 | 17.6 | |
| 17.6 | | | | | |
| | 2 | 6 | 35.3 | 35.3 | |
| 52.9 | | | | | |
| | 3 | 4 | 23.5 | 23.5 | |
| 76.5 | | | | | |

| | | | | |
|---|---|---|---|---|
| | 4 | 4 | 23.5 | 23.5 |
| 100.0 | | | | |
| | | ------- | | ------- |
| | TOTAL | 17 | 100.0 | 100.0 |

VALID CASES 17 MISSING CASES 0

QUES18

| CUM VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT |
|---|---|---|---|---|
| | 1 | 1 | 5.9 | 5.9 |
| 5.9 | | | | |
| | 2 | 7 | 41.2 | 41.2 |
| 47.1 | | | | |
| | 3 | 2 | 11.8 | 11.8 |
| 58.8 | | | | |
| | 4 | 4 | 23.5 | 23.5 |
| 82.4 | | | | |
| | 5 | 3 | 17.6 | 17.6 |
| 100.0 | | | | |
| | | ------- | | ------- |
| | TOTAL | 17 | 100.0 | 100.0 |

VALID CASES 17 MISSING CASES 0

- - - -

QUES20

| VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|
| | 1 | 13 | 76.5 | 76.5 | 76.5 |
| | 2 | 2 | 11.8 | 11.8 | 88.2 |
| | 3 | 1 | 5.9 | 5.9 | 94.1 |
| | 4 | 1 | 5.9 | 5.9 | 100.0 |
| | TOTAL | 17 | 100.0 | 100.0 | |

VALID CASES 17 MISSING CASES 0

- - - -

| | | | | |
|---|---|---|---|---|
| | 4 | 5 | 29.4 | 29.4 |
| 100.0 | | | | |
| | | 17 | 100.0 | 100.0 |

VALID CASES 17 MISSING CASES 0

QUES23

| CUM VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT |
|---|---|---|---|---|
| | 0 | 1 | 5.9 | 5.9 |
| 5.9 | | | | |
| | 1 | 7 | 41.2 | 41.2 |
| 47.1 | | | | |
| | 2 | 7 | 41.2 | 41.2 |
| 88.2 | | | | |
| | 4 | 2 | 11.8 | 11.8 |
| 100.0 | | | | |
| | | 17 | 100.0 | 100.0 |

VALID CASES 17 MISSING CASES 0

QUES24

| CUM VALUE LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT |
|---|---|---|---|---|
| | 1 | 2 | 11.8 | 11.8 |
| 11.8 | | | | |
| | 2 | 8 | 47.1 | 47.1 |
| 58.8 | | | | |
| | 3 | 3 | 17.6 | 17.6 |
| 76.5 | | | | |
| | 4 | 3 | 17.6 | 17.6 |
| 94.1 | | | | |
| | 5 | 1 | 5.9 | 5.9 |
| 100.0 | | | | |
| | | 17 | 100.0 | 100.0 |

VALID CASES 17 MISSING CASES 0

QUES25

| VALUE | LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|---|
| | | 1 | 7 | 41.2 | 41.2 | 41.2 |
| | | 2 | 8 | 47.1 | 47.1 | 88.2 |
| | | 3 | 2 | 11.8 | 11.8 | 100.0 |
| | | TOTAL | 17 | 100.0 | 100.0 | |

VALID CASES 17 MISSING CASES 0

QUES26

| VALUE | LABEL | VALUE | FREQUENCY | PERCENT | VALID PERCENT | CUM PERCENT |
|---|---|---|---|---|---|---|
| | | 1 | 6 | 35.3 | 35.3 | 35.3 |
| | | 2 | 9 | 52.9 | 52.9 | 88.2 |
| | | 3 | 1 | 5.9 | 5.9 | 94.1 |
| | | 4 | 1 | 5.9 | 5.9 | 100.0 |
| | | TOTAL | 17 | 100.0 | 100.0 | |

VALID CASES 17 MISSING CASES 0

- - - -

80

| | | | | |
|---|---|---|---|---|
| | 3 | 2 | 11.8 | 11.8 |
| 100.0 | | | | |
| | | ------- | | ------- |
| | TOTAL | 17 | 100.0 | 100.0 |

VALID CASES 17 MISSING CASES 0

- - - -

81

| CUM VALUE PERCENT | LABEL | | VALUE | FREQUENCY | VALID PERCENT |
|---|---|---|---|---|---|
| 52.9 | | | 1 | 9 52.9 | 52.9 |
| 94.1 | | | 2 | 7 41.2 | 41.2 |
| 100.0 | | | 3 | 1 5.9 | 5.9 |
| | VALID CASES | 17 | TOTAL | 17 100.0 | 100.0 |
| | | | MISSING CASES | 0 | |

Master's Research Paper by

Kelly R. Heidman

B.S., Syracuse University, 1979

M.L.S., Kent State University, 1995

Approved by

Advisor John Jedlicka Date 4/4/95